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The 1995 Gordon Research Conference on Lipid Metabolism was held June 25-30 at Kimball Union Academy in Meriden, New Hampshire.

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Conference Report

The 1995 Gordon Research Conference on Lipid Metabolism was held June 25-30 at Kimball Union Academy in Meriden, New Hampshire. As is typical of this meeting, it was oversubscribed and there was room for only 143 final participants. An effort was made to increase the number of younger participants in the conference, and there were 18 graduate students, 25 postdoctoral fellows, and 100 principal investigators. Women accounted for 36 of the conferees. Of 31 speakers, 23 had not spoken at the previous conference (11 had never spoken at this conference). Eight of the speakers were women. Nine speakers at this conference had spoken at the previous conference. There was 15 minutes allotted for discussion following each slide presentation and the full time was used in each case. Everyone attending the meeting was strongly encouraged to present a poster and there were 104 posters available for viewing and discussion over a period of 4 days.

Each session brought out new and important information in the respective fields.

The Bacterial Lipid Session

1. Identified acyl CoA as an important regulator of both fatty acid synthesis and degradation.

2. Described novel types of lipid A in *Rhizobium* and predicted a new member of the ACP family with unusual properties.

3. Described the protein dependent mechanisms by which defects in lipid synthesis can affect transporter function.

The Sphingolipid Session

1. Described recent progress in the role of ceramide activated protein kinase in signal transduction and highlighted the need for complete purification of the protein and *in vitro* reconstitution of ceramide activation.

2. Presented evidence for sphingosine-phosphate as a mitogenic agent and a direct effector of Ca^{2+} mobilization and critical questions were raised as to the locus of action of this molecule.

3. Elaborated upon recent progress in isolating numerous mutants in sphingolipid synthesis raising the possibility that these mutants will ultimately prove valuable in isolating the mammalian homologs.

The Session on Phosphatidylcholine and Phosphatidylethanolamine Metabolism

1. Described the structure-function relationship of CTP:phosphocholine cytidylyltransferase and identified an unregulated catalytic core component.

2. Elucidated cytidylyltransferase as a target for both anti-neoplastic drugs and lysophosphatidylcholine regulation.

3. Provided evidence that phosphatidylethanolamine methyltransferase 2 expression is inversely correlated with cell growth, especially in liver carcinoma.

4. Elaborated on the presence of two phosphatidylserine decarboxylases in yeast and how mutants defective in these genes are being used to isolate new yeast strains with mutations in interorganelle transport.

The Lipid Modification of Proteins Session

1. Provided detailed information about protein N-myristorylation and the structural requirements of the protein substrate and the interaction of the enzyme with the fatty acid substrate.

2. Described the role of gamma subunit prenylation in the assembly of heterotrimeric G proteins and potential role of prenylcysteine as an important proteolytic metabolite.

3. Provided new information about yeast mutants with defects in phosphatidylinositol anchor assembly and highlighted the utility of these strains for isolating new genes and cDNAs from yeast and humans.

The Session Covering Bioactive Lipids and Derivatives

1. Presented new information on the cloning of the gene for PAF acetyl-hydrolase and provided structure-function analyses by site directed mutagenesis that define residues essential for catalysis.

2. Described the prostaglandin H synthases 1 and 2 and the important regulatory and cytotopologic features of PGH2 synthase.

3. Detailed the cloning of the PI4 kinase gene in yeast.

4. Described the inositolpolyphosphate 5 Pases, their substrate specificities and their involvement in human diseases such as Lowe's syndrome.

The Phospholipase Session

1. Provided new information about the secretory, cytosolic and Ca^{2+}-independent phospholipases and their contributions to arachidonic acid mobilization.

3. Described the purification of a mammalian phospholipase D and its activation by fatty acids and inhibition by a microsomal protein.

3. Presented evidence that phosphatidylinositol transfer protein and ARF dependent phospholipase D may function cooperatively in secretory processes in the neutrophil.

The Lipid Transport Session

1. Provided new information about the mitochondrial associated membrane and its properties and presented new methods for immunoaffinity purification of this subcellular fraction.

2. Described the interrelationship between yeast *sec* mutants and lipid transport and provided initial characterization of yeast strains defective in the plasma membrane transport of phosphatidyl-ethanolamine

3. Presented evidence implicating mdr2 as a gene product involved in plasma membrane transport of phosphatidylcholine.

The Lipid Binding Protein Session

1. Described the structure-function characteristics of fatty acid binding proteins and the role of specific amino acids in the mechanism of lipid transfer.

2. Presented evidence that the phosphatidylinositol transfer protein (sec14p) in yeast functions as a regulator of cytidylyltransferase in yeast and that products of the CDP choline pathway function through other gene products to regulate Golgi function.

3. Described the development and reactivity of antibodies that recognize phosphatidylserine binding motifs.

The Integration of Lipid Metabolism Session

1. Elucidated the central role of CTP levels in modulating lipid metabolism in yeast.

2. Described the isolation of somatic cell mutants defective in phosphatidylglycerol synthesis and their mitochondrial structural abnormalities.

The Cholesterol Session

1. Presented new information about transcriptional regulation of farnesyl pyrophosphate synthase and new data implicating farnesol as an intracellular signaling molecule.

2. Elaborated upon the processing of the sterol regulatory element binding protein 1 and its relationship to apoptosis.

The poster sessions were also an integral and important part of this conference. Many conferees commented on the high quality and important new information that was presented in these sessions. Since I insisted that virtually every non-speaking participant must present a poster, there were a large number presented. Everyone whom I polled felt that the number of posters was appropriate. Several of the speakers also brought out the inter-relationships between new findings in their talks and those described by others in the poster presentations and this helped to integrate different conference programs.

The slide presentations were accompanied by much discussion and the full time allotted for discussion (15 minutes per speaker) was used after each talk. The discussions were thoughtful and provocative and in several instances helped define critical experiments that needed to be carried out.

The feedback that I have received about this conference has been very positive. Students, postdoctoral fellows and principal investigators have all reported that the meeting provided timely new information in a convenient format. I solicited opinions about changing the format of this meeting and was generally met with the opinion that the current structure is most appropriate.